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EXAMINER	
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ART UNIT	PAPER NUMBER
2113	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/954,711	ZAIFMAN ET AL.	
	Examiner	Art Unit	
	Marc Duncan	2113	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 September 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-99* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14,25,26,29,30,32,36,41-43,46,47,51,53,54,64-69,72-78,83,85 and 94* is/are rejected.

7)☒ Claim(s) *15-24,27,28,31,33-35,37-40,44,45,48-50,52,55-63,70,71,79-82,84,86-93 and 95-99* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 September 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Status of the Claims

Claims 2-3, 6, 25-26, 29-30, 34-35, 41-42, 64-65, 67-69, 72-77, 83 and 85 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-14, 25, 26, 30, 32, 36, 43 and 36 are rejected under 35 U.S.C. 102(e) as being anticipated by Roselli et al.

Claims 1-14, 26, 29, 32, 43, 47, 51, 53-54, 64, 66 and 94 are rejected under 35 U.S.C. 102(e) as being anticipated by Kampe et al.

Claim 78 is rejected under 35 U.S.C. 102(e) as being anticipated by Dawkins et al.

Claims 15-24, 27-28, 31, 33-35, 37-40, 44-45, 48-50, 52, 55-63, 70-71, 79-82, 84, 86-93 and 95-99 are objected to.

Priority

Applicant's claim for domestic priority under 35 U.S.C. 119(e) is acknowledged. However, the provisional application upon which priority is claimed fails to provide adequate support under 35 U.S.C. 112 for claims 1-77 and 94-99 of this application.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2-3, 6, 25-26, 29-30, 34-35, 41-42, 64-65, 67-69, 72-77, 83 and 85 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites the limitation "the AM element" in line 1. There is insufficient antecedent basis for this limitation in the claim. It is unclear to which AM element the claim limitation refers.

Claim 3 recites the limitation "the AM element" in lines 1 and 2. There is insufficient antecedent basis for this limitation in the claim. It is unclear to which AM element the claim limitation refers.

Claim 6 recites the limitation "the AM element" in lines 1 and 2. There is insufficient antecedent basis for this limitation in the claim. It is unclear to which AM element the claim limitation refers.

Claim 29 recites the limitation "the AM element" in line 1. There is insufficient antecedent basis for this limitation in the claim. It is unclear to which AM element the claim limitation refers.

Claim 30 recites the limitation "the AM element" in line 2. There is insufficient antecedent basis for this limitation in the claim. It is unclear to which AM element the claim limitation refers.

Claim 34 recites the limitation "the termination notice" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 41 is an improper Markush group. A proper Markush group uses consisting of language and claim 41 attempts to use comprising language.

Claim 64 recites the limitation "the heartbeat signal" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 65 recites the limitation "the heartbeat time period" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 72 depends from itself and it is therefore unclear what the limitations of the claim are intended to be.

Claim 83 recites the limitation "the Logical Default Master mode" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim 85 recites the limitation "the join state machine" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-14, 25, 26, 30, 32, 36, 43 and 36 are rejected under 35 U.S.C. 102(e) as being anticipated by Roselli et al.

Regarding claim 1:

Roselli teaches a plurality of data processing system components, the components each responsible for carrying out a subset of data processing system functions in Fig. 2-6 and col. 3 lines 11-18.

Roselli teaches a plurality of function domains, the domains having associated with them subset of the data processing system functions, with a plurality of peer domain level components thus carrying out the data processing functions for a given domain in col. 4 lines 1-11. The jobs are executed on peer level components.

Roselli teaches the plurality of domains forming a domain hierarchy, at least one component of at least one domain at a given level in the hierarchy providing a failure notification in col. 3 lines 20-28 and col. 4 lines 1-11.

Roselli teaches a system availability manager comprising: a plurality of Availability Manager (AM) elements, each AM element associated with a corresponding one of the data processing system components, the AM elements thus also arranged in an AM hierarchy that parallels the domain hierarchy, at least one AM element connected to receive failure notification from one or more AM elements associated with the data processing system components associated with a next lower domain level in col. 3 lines 20-28 and lines 47-50, col. 18 lines 49-51 and col. 21 line 57-col. 22 line 3. The AM elements are arranged in a hierarchy that mirrors that of the system, i.e. the local, global and universal levels as well as the agents at each job level.

Regarding claim 2:

Roselli teaches wherein the AM element determines if the component in the next lower domain level from which a failure notification was received can be restarted in the Abstract lines 16-19 and col. 3 lines 25-27.

Regarding claim 3:

Roselli teaches wherein the AM element additionally determines if the failure-notifying component can be restarted, and if it can be restarted, the AM element causes that component to be restarted, without notifying a higher level AM element in the AM hierarchy in the Abstract liens 16-19, col. 3 lines 25-27 and col. 9 lines 44-55.

Regarding claim 4:

Roselli teaches wherein the failure notification is caused by termination of processing by the monitored component in col. 13 lines 33-37.

Regarding claim 5:

Roselli teaches wherein the failure notification is caused by an error state in the monitored component in col. 9 lines 44-55.

Regarding claim 6:

Roselli teaches wherein if the AM element determines that the failure-notifying component cannot be restarted, the AM element sends a failure notification to a higher level AM component in the AM hierarchy in col. 9 lines 44-55. If the restart is not available for the same node, a call to a higher level is necessitated in order to restart the failed component.

Regarding claim 7:

Roselli teaches wherein the AM element failure notification is constrained to the next higher level AM element in the hierarchy in col. 9 lines 44-55. Efforts are clearly made to keep the failure notification to the lowest level possible and a call is made to a higher level when necessary.

Regarding claim 8:

Roselli teaches wherein the AM element failure notification is constrained to the next higher level AM element in the hierarchy, such that a higher level AM element in the hierarchy will then be given control over determining whether to send further failure notifications up the AM element hierarchy in col. 9 lines 44-55. The higher lever AM element handles the restart if possible and, if not possible, sends the failure notification to the next level.

Regarding claim 9:

Roselli teaches wherein the data processing system components are both hardware and software components in the Abstract lines 2-6.

Regarding claim 10:

Roselli teaches wherein the software components include, but are not limited to, operating system software in the Abstract lines 2-6.

Regarding claim 11:

Roselli teaches wherein the software components comprise application program processes in col. 10 lines 6-10.

Regarding claim 12:

Roselli teaches wherein the failure notification is a component execution termination notice in col. 13 lines 33-37.

Regarding claim 13:

Roselli teaches wherein the failure notification is a hang state notice in col. 13 lines 15-33.

Regarding claim 14:

Roselli teaches wherein the failure notification is of a hang state detected by a components peer AM element in col. 13 lines 15-33. The AM element uses time out values and heartbeats to check the proper operation and termination of a component.

Regarding claim 25:

Roselli teaches wherein the failure notification includes information as to whether the logical state of the component itself indicates the component can be restarted in col. 4 lines 43-47.

Regarding claim 26:

Roselli teaches wherein components are classified in the hierarchy with regard to a potential severity indication of their failure modalities in col. 9 lines 44-65. It is necessarily true that a failure of a group of clusters is more severe than the failure of a single component or job, and therefore the group of clusters is at a higher level of the hierarchy.

Regarding claim 30:

Roselli teaches wherein at least some of the components of the data processing system are operating system components, the AM element runs an application space

as a process under an operating system, and the failure notification is made by signaling the associated AM element through an operating system message in the Abstract lines 2-6 and col. 13 lines 18-21.

Regarding claim 32:

Roselli teaches a plurality of data processing system components, the components each responsible for carrying out a subset of data processing system functions in Fig. 2-6 and col. 3 lines 11-18.

Roselli teaches a plurality of function domains, the domains having associated with them subset of the data processing system functions, with a plurality of peer domain level components thus carrying out the data processing functions for a given domain, and the plurality of domains forming a domain hierarchy, at least one component of at least one domain at a given level in the hierarchy being restartable in col. 4 lines 1-11.

Roselli teaches system availability manager comprising: a plurality of Availability Manager (AM) elements, each AM element associated with a corresponding one of the data processing system components, the AM elements thus also arranged in an AM hierarchy that parallels the domain hierarchy, at least one AM element connected to restart one or more AM elements associated with the data processing system components associated with a next lower domain level in col. 3 lines 20-28 and lines 47-50, col. 18 lines 49-51 and col. 21 line 57-col. 22 line 3. The AM elements are arranged in a hierarchy that mirrors that of the system, i.e. the local, global and universal levels as well as the agents at each job level.

Regarding claim 36:

Roselli teaches wherein upon receiving a termination notice, the AM element may access component originated state information regarding whether according to the components own logic, the component can be restarted in col. 10 lines 6-13.

Regarding claim 43:

Roselli teaches wherein the data processing system components maintain internal state information in persistent storage to permit warm restart processing in col. 10 lines 6-13.

Regarding claim 46:

Roselli teaches wherein an operating system component reclaims resources upon termination of a process element in col. 13 lines 18-21. It is necessarily true that an operating system will inherently reclaim resources from a process that has terminated and ceased utilizing the resources.

Claims 1-14, 26, 29, 32, 43, 47, 51, 53-54, 64, 66 and 94 are rejected under 35 U.S.C. 102(e) as being anticipated by Kampe et al.

Regarding claim 1:

Kampe teaches a plurality of data processing system components, the components each responsible for carrying out a subset of data processing system functions in Fig. 3 and 4 and col. 6 lines 51-52.

Kampe teaches a plurality of function domains, the domains having associated with them subset of the data processing system functions, with a plurality of peer domain level components thus carrying out the data processing functions for a given

domain, and the plurality of domains forming a domain hierarchy, at least one component of at least one domain at a given level in the hierarchy providing a failure notification in col. 6 lines 16-19 and lines 31-34 and col. 7 line 60-col. 8 line 10.

Kampe teaches a system availability manager comprising: a plurality of Availability Manager (AM) elements, each AM element associated with a corresponding one of the data processing system components, the AM elements thus also arranged in an AM hierarchy that parallels the domain hierarchy, at least one AM element connected to receive failure notification from one or more AM elements associated with the data processing system components associated with a next lower domain level in col. 7 line 60-col. 8 line 10 and col. 10 lines 19-26. Each component is responsible for detecting, handling and reporting failures and therefore encompasses an availability manager.

Regarding claim 2:

Kampe teaches wherein the AM element determines if the component in the next lower domain level from which a failure notification was received can be restarted in col. 11 lines 22-28.

Regarding claim 3:

Kampe teaches wherein the AM element additionally determines if the failure-notifying component can be restarted, and if it can be restarted, the AM element causes that component to be restarted, without notifying a higher level AM element in the AM hierarchy in col. 11 lines 22-28. The CRIM restarts the component without notifying a higher level AM element.

Regarding claim 4:

Kampe teaches wherein the failure notification is caused by termination of processing by the monitored component in col. 11 lines 10-30.

Regarding claim 5:

Kampe teaches wherein the failure notification is caused by an error state in the monitored component in col. 11 lines 10-30.

Regarding claim 6:

Kampe teaches wherein if the AM element determines that the failure-notifying component cannot be restarted, the AM element sends a failure notification to a higher level AM component in the AM hierarchy in col. 11 lines 34-40. If the CRIM cannot restart the component itself, it notifies another service so that the service may restart the component.

Regarding claim 7:

Kampe teaches wherein the AM element failure notification is constrained to the next higher level AM element in the hierarchy in col. 11 lines 22-28. When the CRIM can handle the recovery action, the failure notification is constrained to that level.

Regarding claim 8:

Kampe teaches wherein the AM element failure notification is constrained to the next higher level AM element in the hierarchy, such that a higher level AM element in the hierarchy will then be given control over determining whether to send further failure notifications up the AM element hierarchy in col. 11 lines 22-28. The CRIM decides whether or send further notifications.

Regarding claim 9:

Kampe teaches wherein the data processing system components are both hardware and software components in Fig. 6 and col. 7 lines 43-46.

Regarding claim 10:

Kampe teaches wherein the software components include, but are not limited to, operating system software in Fig. 4.

Regarding claim 11:

Kampe teaches wherein the software components comprise application program processes in col. 7 lines 43-46.

Regarding claim 12:

Kampe teaches wherein the failure notification is a component execution termination notice in col. 11 lines 10-30.

Regarding claim 13:

Kampe teaches wherein the failure notification is a hang state notice in col. 13 lines 1-4.

Regarding claim 14:

Kampe teaches wherein the failure notification is of a hang state detected by a components peer AM element in col. 13 lines 1-4.

Regarding claim 26:

Kampe teaches wherein components are classified in the hierarchy with regard to a potential severity indication of their failure modalities in Fig. 3 and 4. The hierarchy

is arranged by the importance and overall impact on system function, i.e. a higher level component causes failures in all lower level components.

Regarding claim 29:

Kampe teaches wherein the AM element determines whether the associated component itself can be restarted without affecting operation of other data processing system components in col. 5 lines 16-18 and col. 6 lines 28-30.

Regarding claim 32:

Kampe teaches a plurality of data processing system components, the components each responsible for carrying out a subset of data processing system functions in Fig. 3 and 4 and col. 6 lines 51-52.

Kampe teaches a plurality of function domains, the domains having associated with them subset of the data processing system functions, with a plurality of peer domain level components thus carrying out the data processing functions for a given domain, and the plurality of domains forming a domain hierarchy, at least one component of at least one domain at a given level in the hierarchy being restartable in col. 6 lines 16-19 and lines 31-34 and col. 7 line 60-col. 8 line 10.

Kampe teaches a system availability manager comprising: a plurality of Availability Manager (AM) elements, each AM element associated with a corresponding one of the data processing system components, the AM elements thus also arranged in an AM hierarchy that parallels the domain hierarchy, at least one AM element connected to restart one or more AM elements associated with the data processing

system components associated with a next lower domain level in col. 7 line 60-col. 8 line 10 and col. 10 lines 19-26 and col. 11 lines 22-28.

Regarding claim 43:

Kampe teaches wherein the data processing system components maintain internal state information in persistent storage to permit warm restart processing in col. 15 lines 37-62.

Regarding claim 46:

Kampe teaches wherein an operating system component reclaims resources upon termination of a process element in col. 23 lines 1-6.

Regarding claim 47:

Kampe teaches wherein an operating system component maintains state information regarding resources in use by executing processes in col. 23 lines 1-6.

Regarding claim 51:

Kampe teaches wherein the AM element hierarchy includes a system manager root level, process manager child level, and card manager parent level in the AM element hierarchy in Fig. 3-4 and col. 22 lines 7-12. A CPU is contained by a CPU card and a process running on the CPU is contained by the CPU. Each component contains its own monitor; therefore the claimed levels are present.

Regarding claim 53:

Kampe teaches wherein the AM element hierarchy includes a card manager root level, system manager child level, and watchdog timer parent level in the AM element

hierarchy in col. 19 lines 13-19 and col. 22 lines 7-12. A CPU is contained by a CPU card that is monitored by a watchdog timer.

Regarding clam 54:

Kampe teaches a plurality of data processing system components, the components comprising system cards, processors, and software processes that execute on the processors, the components thus forming a function domain hierarchy in Fig. 3 and 4 and col. 6 lines 51-52.

Kampe teaches a plurality of Availability Manager (AM) elements, each AM element associated with at least one of the data processing system components, the AM elements also arranged in a hierarchy that parallels the domain hierarchy such that

a card manager (CM) element in the AM hierarchy is associated with a system card component in col. 7 line 60-col. 8 line 10 and col. 10 lines 19-26 and col. 11 lines 22-28.

a system manager (SM) element in the AM hierarchy is associated with a processor component in col. 7 line 60-col. 8 line 10 and col. 10 lines 19-26 and col. 11 lines 22-28.

a process manager (PM) in the AM hierarchy is associated with a software process component in col. 7 line 60-col. 8 line 10 and col. 10 lines 19-26 and col. 11 lines 22-28.

Kampe teaches at least one of the AM elements is connected to restart components associated with a next lower domain level in col. 11 lines 22-28.

Regarding claim 64:

Kampe teaches wherein peer AM elements detect a hung component by sending the heartbeat signal at a determined time period interval in col. 9 lines 19-23.

Regarding claim 66:

Kampe teaches wherein a hardware component detects an event that all AM elements at the same level hang in col. 9 lines 19-23. The cluster master uses heartbeats to monitor hang states of all the clusters.

Regarding claim 94:

Kampe teaches executing a plurality of AM element processes in a multi-tasking environment, the AM element processes arranged in a hierarchy, with the hierarchy of the AM elements corresponding to a failure modality hierarchy of the data processing system components in col. 7 line 60-col. 8 line 10 and col. 10 lines 19-26 and col. 11 lines 22-28.

Kampe teaches within a given AM element process, receiving a termination notice from one of the data processing system components in col. 7 line 60-col. 8 line 10 and col. 10 lines 19-26. Each component is responsible for detecting, handling and reporting failures and therefore encompasses an availability manager.

Kampe teaches if the data processing system component can be restarted by the AM element process, then restarting the component in col. 7 line 60-col. 8 line 10. Each component must repair itself if possible.

Kampe teaches if the data processing system component cannot be restarted by the AM element process, providing a termination notice to a higher level AM element process in col. 7 line 60-col. 8 line 10 and col. 11 lines 16-19. If not possible to repair

itself, the component is responsible for notifying a higher level AM element, i.e. the CRIM in a particular embodiment.

Kampe teaches terminating execution of the AM element process in col. 11 lines 16-19 and col. 11 lines 22-28. The component is terminated after requesting to be taken offline.

Claim 78 is rejected under 35 U.S.C. 102(e) as being anticipated by Dawkins et al.

Regarding claim 78:

Dawkins teaches entering an initialization state in col. 4 lines 18-24.

Dawkins teaches determining a physical position for the component with respect to other components in the system in col. 4 lines 18-24 and Fig. 4A and 4B. The processor determines its physical position such that it can read the proper portion of the mapping table.

Dawkins teaches reading state information as to master state assertions by other components in col. 4 lines 25-50

Dawkins teaches temporarily initializing a local master state register to the asserted state, if no other component has asserted the master state in the Abstract lines 13-14.

Dawkins teaches waiting a predetermined pause period in col. 4 lines 51-60. The examiner interprets the time that elapses while writing to the alternate cell and summing the other alternate cells to be equivalent to a predetermined pause period.

Dawkins teaches reading other components master state assertions in col. 4 lines 59-65.

Dawkins teaches committing to assume the master state for further execution should no other component have asserted the master state during the waiting period in col. 4 line 65-col. 5 line 2.

Allowable Subject Matter

Claim 15-24, 27-28, 31, 33-35, 37-40, 44-45, 48-50, 52, 55-63, 70-71, 79-82, 84, 86-93 and 95-99 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marc Duncan whose telephone number is 571-272-3646. The examiner can normally be reached on M-F 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Beausoliel can be reached on 571-272-3645. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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